JVC

SERVICE MANUAL

COLOR TELEVISION

AV-20F475/S,
AV-N21F45/S

BASIC CHASSIS
FJ2

I'Art™

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No.YA052
2004/4

SPECIFICATION

Items		Contents
Dimensions (W × H × D)		66.7cm × 47.7cm × 50.5cm (26-1/4" × 18-13/16" × 19-7/8")
Mass		25kg (55lbs)
TV RF System		CCIR(M)
Color System		NTSC
Sound System		BTSC (Multi Channel Sound)
TV Receiving Channels and Frequency	VHF Low VHF High UHF CATV	02ch~06ch : 54MHz~88MHz 07ch~13ch : 174MHz~216MHz 14ch~69ch : 470MHz~806MHz 54MHz~804MHz Low Band : 02~06, A-8 by 02~06&01 High Band : 07~13 by 07~13 Mid Band : A~I by 14~22 Super Band : J~W by 23~36 Hyper Band : W+1~W+28 by 37~64 Ultra Band : W+29~W+84 by 65~125 Sub Mid Band : A8, A4~A1 by 01, 96~99
TV / CATV Total Channel		180 Channels
Intermediate Frequency	Video IF Sound IF	45.75 MHz 41.25 MHz (4.5MHz)
Color Sub Carrier		3.58 MHz
Power Input		AC120V, 60Hz
Power Consumption		85W
Picture Tube		20" (51cm) Measured diagonally, full square (H:30.5cm × W:40.6cm)
High Voltage		26.0kV ±1.3kV (at zero beam current)
Speaker		6.5cm × 13cm (2-1/2" × 5"), Oval type × 2
Audio Power Output		3W + 3W
Antenna Terminal (VHF/UHF)		F-type connector, 75Ω unbalanced, coaxial × 1
Video / Audio input [INPUT-1/2/3]	Component Video [INPUT-2] S-video [INPUT-1] Video Audio	RCA pin jack × 3 Y : 1V(p-p), negative sync, 75 Ω Pb/Pr : 0.7V(p-p), 75 Ω Mini DIN 4-pin × 1 Y : 1V(p-p), negative sync, 75 Ω C : 0.286V(p-p)(burst signal), 75 Ω 1V(p-p), negative sync, 75 Ω, RCA pin jack × 3 500mV(rms)(-4dBs), high impedance, RCA pin jack × 6
Audio Output (Fix)		500mV(rms)(-4dBs), low Impedance, (400kHz when modulated 100%), RCA pin jack × 2
Headphone Jack		3.5mm mini jack × 1
Remote Control Unit		RM-C1258G (AA/R6/UM-3 battery × 2)

Design & specifications are subject to change without notice.

SECTION 1
PRECAUTION

1.1 SAFETY PRECAUTIONS

(1) The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.

(2) Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.

(3) Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (⚠) on the parts list in Service manual**. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.

(4) **Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.

(5) **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : (⊥) side GND, the ISOLATED (NEUTRAL) : (⏚) side GND and EARTH : (⏚) side GND.
Don't short between the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND and never measure the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND at the same time with a measuring apparatus (oscilloscope etc.). If above note will not be kept, a fuse or any parts will be broken.

(6) If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See B1 POWER SUPPLY check).

(7) The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.

(8) Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10kΩ 2W resistor to the anode button.

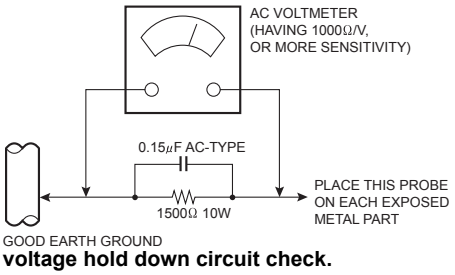
(9) When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

(10) **Isolation Check (Safety for Electrical Shock Hazard)**
After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screw heads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

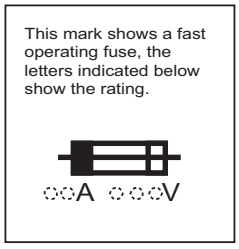
a) **Dielectric Strength Test**
The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1100V AC (r.m.s.) for a period of one second.
(. . . . Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.) This method of test requires a test equipment not generally found in the service trade.

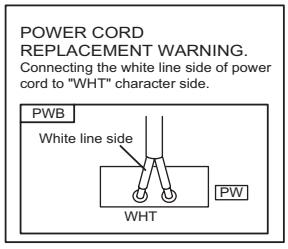
b) **Leakage Current Check**
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).
However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

Alternate Check Method
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000Ω per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).
However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



(11) **High voltage hold down circuit check.**
After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.See item **"How to check the high voltage hold down circuit"**.





SECTION 2
SPECIFIC SERVICE INSTRUCTIONS

2.1 FEATURES

SMART SOUND
Decreases high sound levels, giving a regulated sound level.

SMART CAPTION
Smart Caption will appear when you press the MUTING button, only on channels where the broadcast contains closed captioning.

DIGITAL COMB FILTER
By the 3 line digital comb filter, the refreshed image can be seen.

VIDEO STATUS
Expression of a favorite screen can be chosen by the VIDEO STATUS function.
[STANDARD ↔ DYNAMIC ↔ THEATER ↔ GAME]

FLAT SQUARE CRT
It became legible from any position by CRT with few reflection and reflect lumps on the flat screen.

COMPONENT INPUT
Since the component signal input terminal is equipped, it reappears direct without deteriorating the signal from DVD.

MTS STEREO
The voice multiplex function of the MTS system is built in. (MTS = Multi channel TV Sound system)

RETURN PLUS
You can program a specific channel to return to while scanning through the channels using the CH+ and CH - keys.

VIDEO INPUT LABEL
This function is used to label video input connections for the onscreen displays.

HYPER SURROUND
Creates a deep, three-dimensional sound effect by channeling the audio through the TV's front-firing speakers.

V-CHIP [AV-20F475]
Since the V-CHIP is built in, it can choose, view and listen to a healthy program.

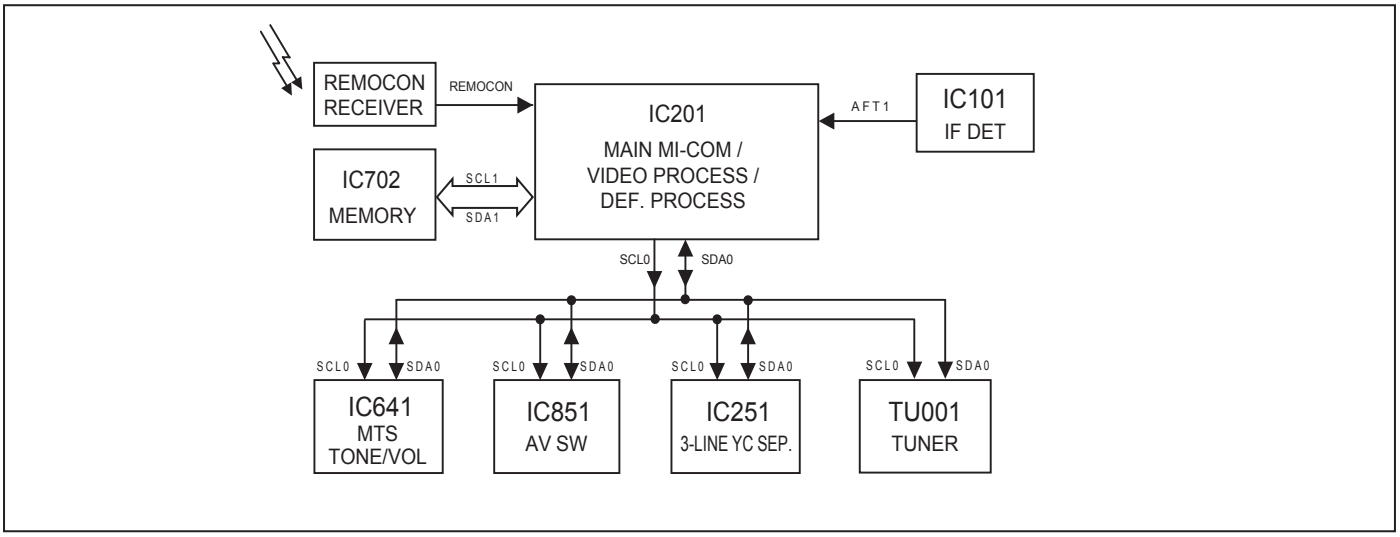
WORLD CLOCK [AV-20F475]
The world clock feature provides time differences for some of the major cities around the world in real time.

2.2 MAIN DIFFERENCE LIST

Item	AV-20F475/S	AV-N21F45/S
DESTINATION	USA, CANADA	MEXICO, PANAMA
V-CHIP	YES	NO
WORLD CLOCK	YES	NO
OSD LANGUAGE	ENG.	ESP.

2.3 TECHNICAL INFORMATION

2.3.1 SYSTEM BLOCK DIAGRAM



2.3.2 MAIN MI-COM (CPU) PIN FUNCTION

Pin No.	Pin name	I/O	Function	Pin No.	Pin name	I/O	Function
1	MTS_ADJ	I	Not used	29	YC_GND	-	GND
2	AFT1	I	AFT voltage for tuner (Tuning frequency control)	30	V1_IN	I	Not used
3	KEY	I	Key scan for front control [No signal : H]	31	ABCL	I	Current for automatic beam (brightness)/contrast limit
4	uP_DVss	-	GND	32	MONITOR_OUT	O	Not used
5	Reset	I	CPU reset [Reset : L]	33	BLACK_DET	-	Black level detection filter
6	8MHz_OUT	O	CPU system clock : 8MHz oscillation	34	NA	O	Not used
7	8MHz_IN	I	CPU system clock : 8MHz oscillation	35	APL_FIL	-	Average picture level filter
8	TEST	-	GND	36	APC_FIL	-	Automatic phase control filter
9	uP_DVdd	I	5V	37	fsc_OUT	O	Color sub carrier (3.58MHz) for 3-line digital comb filter [IC251]
10	AGC_MUTE	O	AGC muting for tuner (when channel select) [Muting : H]	38	YC_Vcc	I	5V (for video process circuit)
11	uP_VVss	-	GND	39	R_OUT	O	R signal
12	TV_HGND	-	GND	40	G_OUT	O	G signal
13	FBP_SCP	I	Flyback pulse (H. pulse)	41	B_OUT	O	B signal
14	HOUT	O	H. drive (oscillation)	42	RGB_Vcc	I	9V (for RGB process circuit)
15	H_Vcc	I	9V (for H. oscillation start)	43	IK_IN	I	Not used
16	HAFC_1	-	H. AFC filter	44	TV_AGND	-	GND
17	Vsaw	-	V. saw filter	45	uP_AGND	-	GND
18	VOUT	O	V. drive	46	uP_AVdd	I	5V
19	EW_OUT	O	Not used	47	MAIN_POWER	O	Power on/off switching control [Powen on : L]
20	X-RAY	I	X-ray detection (for protection) [Detection : H]	48	HAZARD	I	Not used
21	Ys	I	Not used	49	SDA0	I/O	Data for Inter IC control bus (for various devices)
22	Cb_IN	I	Cb (external) signal	50	SCL0	O	Clock for Inter IC control bus (for various devices)
23	Y_IN	I	Y (external) signal	51	SDA1	I/O	Data for Inter IC control bus (for main memory)
24	Cr_IN	I	Cr (external) signal	52	AUDIO_MUTE	O	Audio muting [Muting : H]
25	TV_DVcc	I	3.3V	53	SCL1	O	Clock for Inter IC control bus (for main memory)
26	V3_IN/C_IN	I	Chroma signal (for YC separation output)	54	LED	O	POWER / ON TIMER LED Indication [lighting : L]
27	EHT_IN	I	Not used	55	REMOCON	I	Remote control sensor [No input : H]
28	V2_IN/Y_IN	I	Y signal (for YC separation output)	56	COMPULINK	I	Not used

SECTION 3
DISASSEMBLY

3.1 DISASSEMBLY PROCEDURE

3.1.1 REMOVING THE REAR COVER

(1) Unplug the power plug.
(2) Remove the 7 screws **[A]** as shown in the Fig.1.
(3) Remove the 4 screws **[B]** as shown in the Fig.1.
(4) Withdraw the REAR COVER toward you.

3.1.2 REMOVING THE MAIN PWB

• Remove the REAR COVER.
(1) Raise the backside of the MAIN PWB, and remove the PWB STOPPER **[C]** from the cabinet.
(2) Withdraw the MAIN PWB backward. (If necessary, remove the wire clamp, connectors etc.)

3.1.3 REMOVING THE SPEAKER

• Remove the REAR COVER.
(1) Remove the 2 screws **[D]**, then remove the SPEAKER with SPEAKER HOLDER.
(2) Remove the 4 screws **[E]**, then remove the SPEAKER from the SPEAKER HOLDER.
(3) Follow the same steps when remove the other hand SPEAKER.

3.1.4 CHECKING THE MAIN PWB

To check the PW Board from back side.
(1) Pull out the MAIN PWB (refer to REMOVING THE MAIN PWB).
(2) Erect the MAIN PWB vertically with the HVT side facing up so that you can easily check the back side of the MAIN PWB.

CAUTION :

• When erecting the MAIN PWB, be careful so that there will be no contacting with other PW Board.
• Before turning on power, make sure that the wire connector is properly connected.
• **When conducting a check with power supplied, be sure to confirm that the CRT EARTH WIRE (BRAIDED ASS'Y) is connected to the CRT SOCKET PWB.**

3.1.5 WIRE CLAMPING AND CABLE TYING

(1) Be sure to clamp the wire.
(2) Never remove the cable tie used for tying the wires together. Should it be inadvertently removed, be sure to tie the wires with a new cable tie.

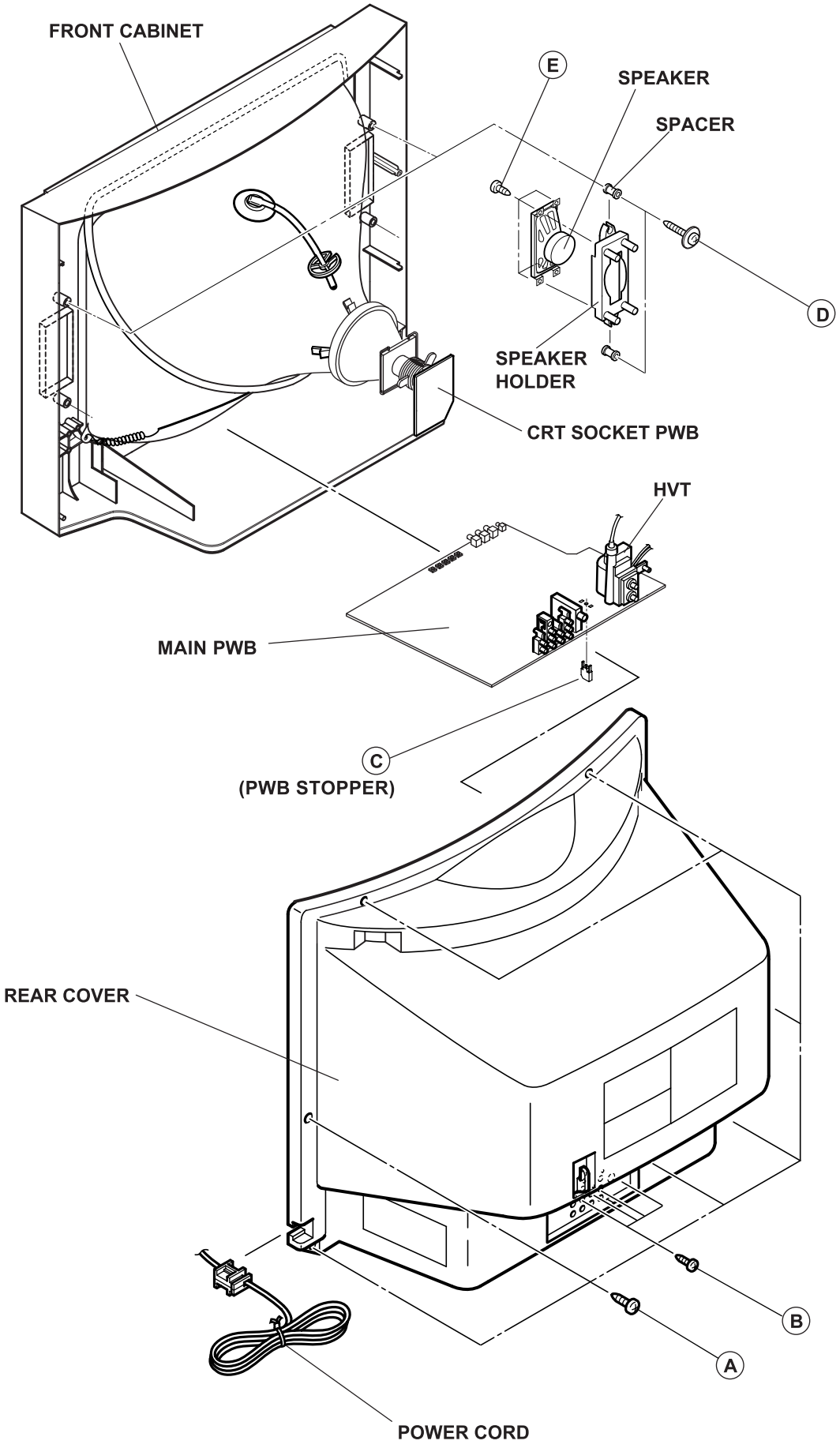

FRONT CABINET
E
SPEAKER
SPACER
D
SPEAKER
HOLDER
CRT SOCKET PWB
HVT
MAIN PWB
C
(PWB STOPPER)
REAR COVER
B
A
POWER CORD

Fig.1

3.2 MEMORY IC REPLACEMENT

- This model uses the memory IC.
- This memory IC stores data for proper operation of the video and drive circuits.
- When replacing, be sure to use an IC containing this (initial value) data.

3.2.1 MEMORY IC REPLACEMENT PROCEDURE

1. Power off
Switch off the power and disconnect the power plug.

2. Replace the memory IC
Be sure to use the memory IC written with the initial setting values.

3. Power on
Connect the power plug to the AC outlet and switch on the power.

4. Receiving channel setting
Refer to the OPERATING INSTRUCTIONS and set the receive channels (Channels Preset) as described.

5. User setting
Check the user setting items according to the given in page later. Where these do not agree, refer to the OPERATING INSTRUCTIONS and set the items as described.

6. SERVICE MODE setting
Verify what to set in the SERVICE MODE, and set whatever is necessary (Fig.1). Refer to the SERVICE ADJUSTMENT for setting.

3.2.2 SERVICE MODE SETTING ITEMS

SERVICE MENU

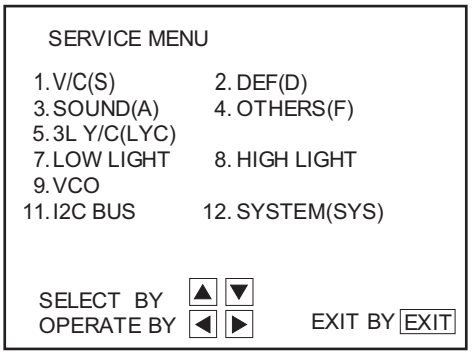


Fig.1

Setting items	Settings	Item No.
1. V/C(S) (Video setting)	Adjust	S01~S47
2. DEF(D) (Deflection setting)	Adjust	D01~D33
3. SOUND(A) (Audio setting)	Adjust	A01~A08
4. OTHERS [Do not adjust] (Factory setting)	Fixed	F01~F18
5. 3L Y/C [Do not adjust] (Y/C separate setting)	Fixed	LYC01~LYC12
7. LOW LIGHT (White balance setting)	Adjust	---
8. HIGH LIGHT (White balance setting)	Adjust	---
9. VCO (VCO setting)	Adjust	---
11. I2C BUS [Do not adjust] (I^2C BUS setting)	Fixed	---
12.SYSTEM (SYS) (System constant setting)	Fixed	SYS01~SYS25

3.2.3 SETTINGS OF FACTORY SHIPMENT

3.2.3.1 BUTTON OPERATION

Setting item	Setting position
POWER	Off
CHANNEL	CH-02
VOLUME	10

3.2.3.2 REMOTE CONTROL DIRECT OPERATION

Setting item	Setting position
INPUT	TV
CHANNEL	CH-02
VOLUME	10
MUTING	OFF
DISPLAY	OFF
OFF TIMER	OFF
VIDEO STATUS	DYNAMIC
ASPECT	4:3
HYPER SORROUND	OFF

3.2.3.3 REMOTE CONTROL MENU OPERATION

(1) PICTURE ADJUST

Setting item	Setting position
TINT	0
COLOR	0
PICTURE	+8
BRIGHT	0
DETAIL	+8
COLOR TEMPERRATURE	HIGH
NOISE MUTING	ON

(2) SOUND ADJUST

Setting item	Setting position
BASS	Center
TREBLE	Center
BALANCE	Center
MTS	STEREO
SMART SOUND	OFF

(3) CLOCK / TIMERS

Setting item	Setting position
SET CLOCK	OFF
ON / OFF TIMER	OFF
WORLD CLOCK	Refer to OPERATING INSTRUCTIONS [AV-20F475]

(4) INITIAL SETUP

Setting item	Setting position
LANGUAGE	ENG. [AV-20F475] ESP. [AV-N21F45]
CLOSED CAPTION	OFF
FRONT PANEL LOCK	OFF
AUTO SHUT OFF	OFF
XDS ID	ON
VIDEO INPUT LABEL	Refer to OPERATING INSTRUCTIONS
V-CHIP	OFF [AV-20F475]

3.3 REPLACEMENT OF CHIP COMPONENT

3.3.1 CAUTIONS

(1) Avoid heating for more than 3 seconds.
(2) Do not rub the electrodes and the resist parts of the pattern.
(3) When removing a chip part, melt the solder adequately.
(4) Do not reuse a chip part after removing it.

3.3.2 SOLDERING IRON

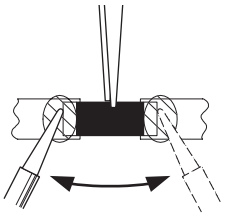
(1) Use a high insulation soldering iron with a thin pointed end of it.
(2) A 30w soldering iron is recommended for easily removing parts.

3.3.3 REPLACEMENT STEPS

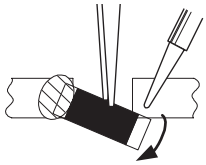
1. How to remove Chip parts

[Resistors, capacitors, etc.]

(1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.



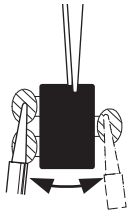
(2) Shift with the tweezers and remove the chip part.



[Transistors, diodes, variable resistors, etc.]

(1) Apply extra solder to each lead.

(2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.



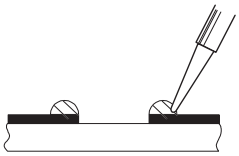
NOTE :

After removing the part, remove remaining solder from the pattern.

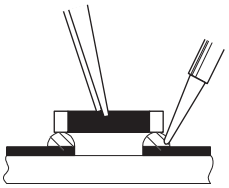
2. How to install Chip parts

[Resistors, capacitors, etc.]

(1) Apply solder to the pattern as indicated in the figure.

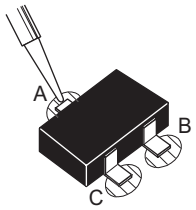


(2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.

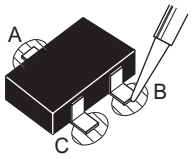


[Transistors, diodes, variable resistors, etc.]

(1) Apply solder to the pattern as indicated in the figure.
(2) Grasp the chip part with tweezers and place it on the solder.
(3) First solder lead **A** as indicated in the figure.



(4) Then solder leads **B** and **C**.



SECTION 4
ADJUSTMENT

4.1 ADJUSTMENT PREPARATION

(1) **There are 2 ways of adjusting this TV : One is with the REMOTE CONTROL UNIT and the other is the conventional method using adjustment parts and components.**

(2) **The adjustment using the REMOTE CONTROL UNIT is made on the basis of the initial setting values. The setting values which adjust the screen to the optimum condition can be different from the initial setting values.**

(3) Make sure that connection is correctly made AC to AC power source.

(4) Turn on the power of the TV and measuring instruments for warming up for at least 30 minutes before starting adjustments.

(5) If the receive or input signal is not specified, use the most appropriate signal for adjustment.

(6) Never touch the parts (such as variable resistors, transformers and condensers) not shown in the adjustment items of this service adjustment.

4.2 PRESET SETTING BEFORE ADJUSTMENTS

Unless otherwise specified in the adjustment items, preset the following functions with the REMOTE CONTROL UNIT.

Item	Preset value
VIDEO STATUS	STANDARD
TINT / COLOR / PICTURE / BRIGHT / DETAIL	Center
COLOR TEMPERTURE	LOW
BASS / TREBLE / BALANCE	Center
MTS	STEREO
HYPER SORROUND	OFF
ASPECT	4:3

4.3 MEASURING INSTRUMENT AND FIXTURES

- DC voltmeter (or digital voltmeter)
- Oscilloscope
- Signal generator (Pattern generator) [NTSC]
- TV audio multiplex signal generator
- Remote control unit

4.4 ADJUSTMENT ITEMS

■ CHECK ITEM
- B1 VOLTAGE check
- HIGH VOLTAGE HOLD DOWN check

■ TUNER / IF CIRCUIT
- IF VCO adjustment

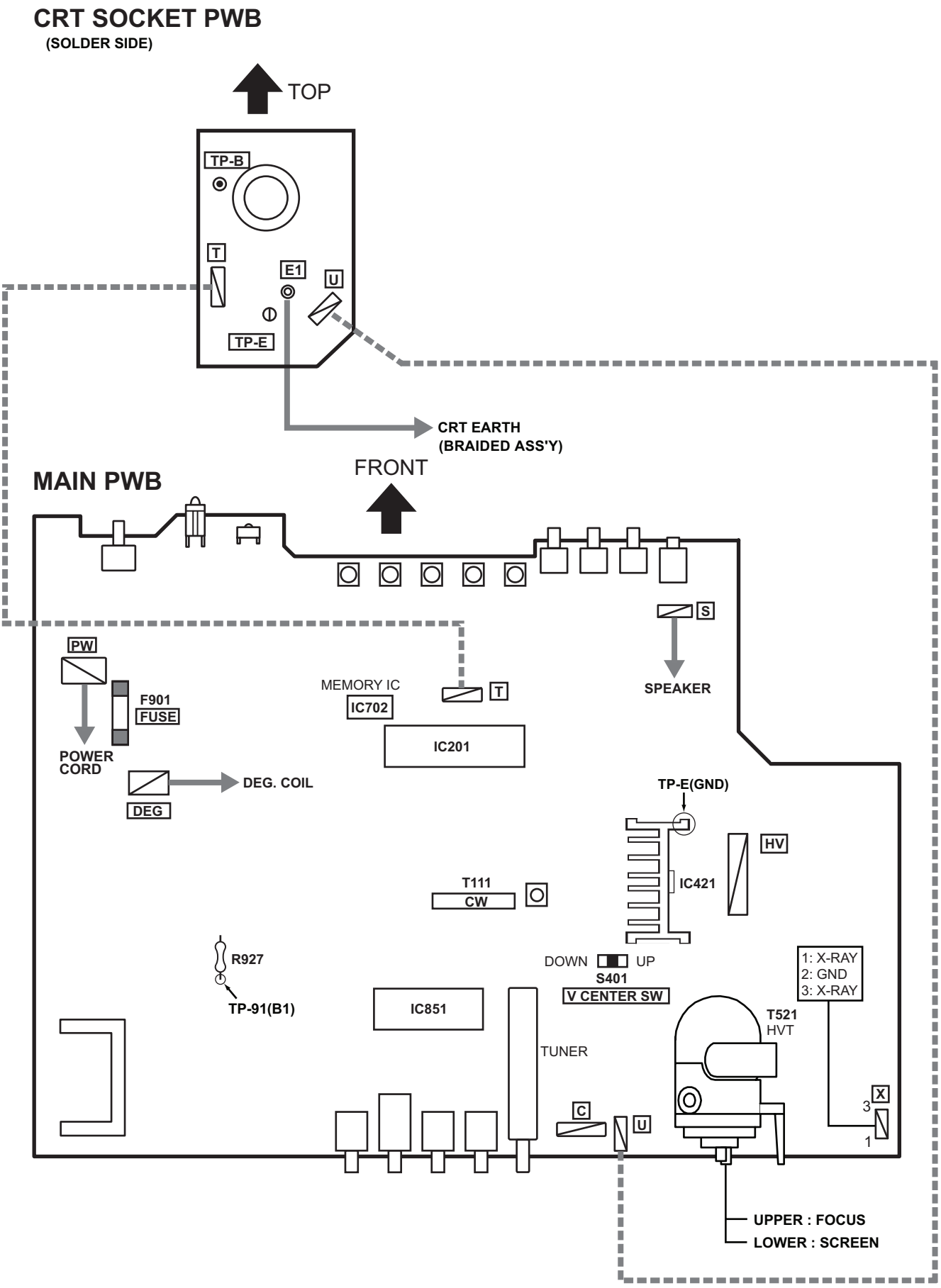
■ ADJUSTMENT OF FOCUS
- FOCUS

■ DEFLECTION CIRCUIT
- 4:3 V. SIZE & V. CENTER adjustment
- 16:9 V. SIZE & V. CENTER adjustment
- 4:3 H. POSITION /H. SIZE / SIDE PIN adjustment
- 16:9 H. POSITION /H. SIZE / SIDE PIN adjustment

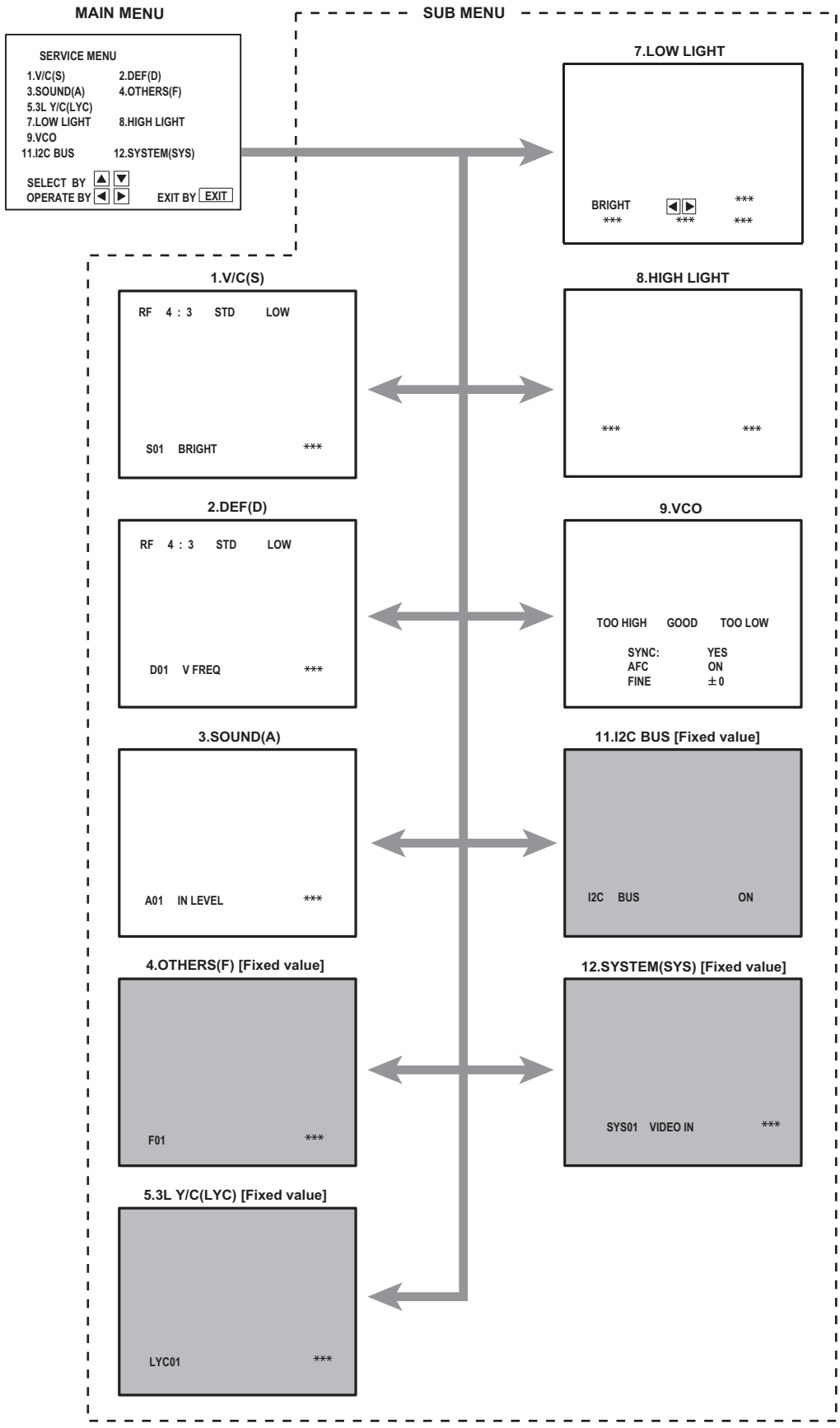
■ VIDEO CIRCUIT
- WHITE BALANCE (LOW LIGHT) adjustment
- WHITE BALANCE (HIGH LIGHT) adjustment
- SUB BRIGHT adjustment
- SUB CONTRAST adjustment

■ MTS CIRCUIT
- MTS INPUT LEVEL check
- MTS SEPARATION adjustment

4.5 ADJUSTMENT LOCATIONS



4.6 BASIC OPERATION OF SERVICE MODE



4.6.1 TOOL OF SERVICE MODE OPERATION

Operate the SERVICE MODE with the REMOTE CONTROL UNIT.

4.6.2 SERVICE MODE ITEMS

In general, basic setting (adjustments) items or verifications are performed in the SERVICE MODE.

1. V/C (S)	This sets the setting values of the VIDEO circuit.
2. DEF (D)	This sets the setting values of the DEFLECTION circuit.
3. SOUND (A)	This sets the setting values of the AUDIO circuit.
4. OTHERS (F)	This sets the setting values of the factory settings. **[Do not adjust]**
5. 3L Y/C(LYC)	This sets the setting values of the 3 line YC separation control circuit. **[Do not adjust]**
7. LOW LIGHT	This sets the setting values of the WHITE BALANCE (LOW LIGHT) control circuit.
8. HIGH LIGHT	This sets the setting values of the WHITE BALANCE (HIGH LIGHT) control circuit.
9. VCO	This sets the setting values of the VCO control circuit.
11. I2C BUS	This sets the setting values of the I^2C BUS control circuit. **[Do not adjust]**
12. SYSTEM(SYS)	This sets the setting values of the system control circuit. **[Do not adjust]**

4.6.3 HOW TO ENTER THE SERVICE MODE

(1) Set to 0 minutes using the [SLEEP TIMER] key.
(2) Press the [VIDEO STATUS] key and [DISPLAY] key simultaneously, then enter the SERVICE MODE.

NOTE:

Before entering the SERVICE MODE, confirm that the setting of TV / CATV switch of the REMOTE CONTROL UNIT is at the "TV" side and the setting of VCR / DVD switch is at the "VCR" side. If the switches have not been properly set, you cannot enter the SERVICE MODE.

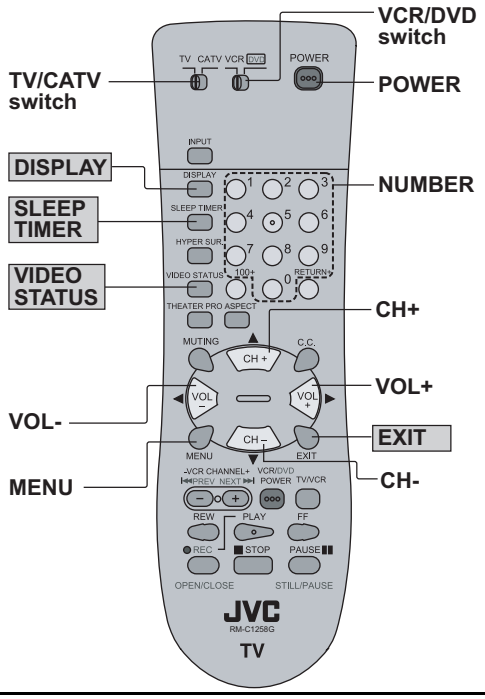
4.6.4 HOW TO STORE OF SETTING VALUE

The setting value will be stored automatically when release the REMOTE CONTROL UNIT keys

4.6.5 HOW TO EXIT THE SERVICE MODE

Press the [EXIT] key to exit the SERVICE MODE.

SERVICE MODE SELECT KEY



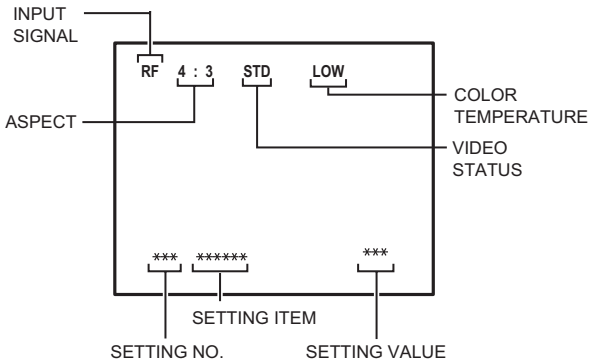
4.6.6 SERVICE MODE SETTING

1. V/C(S), 2. DEF(D)

- Press [CH+] / [CH-] key
  For scrolling up/down the adjustment item.
- Press [VOL+] / [VOL-] key
  For scrolling up/down the data values.

NOTE:

The setting value will be stored automatically when release the REMOTE CONTROL UNIT keys.



(1) INPUT SIGNAL

RF	: Antenna input
COMP	: External (Component) input
EXT	: External (S / Composite) input

(2) ASPECT

4:3	: 4:3 screen mode
16:9	: 16:9 screen mode

(3) VIDEO STATUS

STD	: STANDARD
THEA	: THEATER

(4) COLOR TEMPERATURE

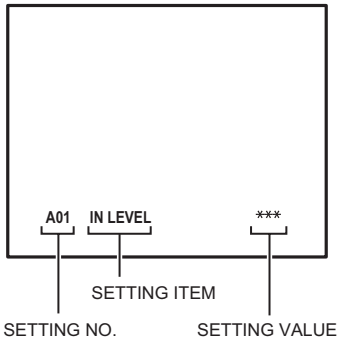
HIGH	: White balance high mode
LOW	: White balance low mode

3. SOUND (A)

- Press [CH+] / [CH-] key
  For scrolling up/down the adjustment item.
- Press [VOL+] / [VOL-] key
  For scrolling up/down the data values.

NOTE:

The setting value will be stored automatically when release the REMOTE CONTROL UNIT keys.

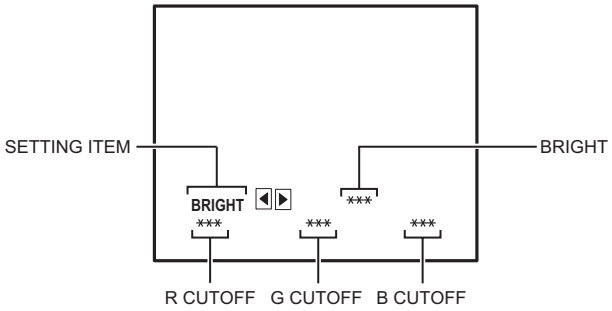


7. LOW LIGHT

The settings for LOW LIGHT is described in the WHITE BALANCE page of ADJUSTMENT PROCEDURE.

NOTE:

The setting value will be stored automatically when release the REMOTE CONTROL UNIT keys.

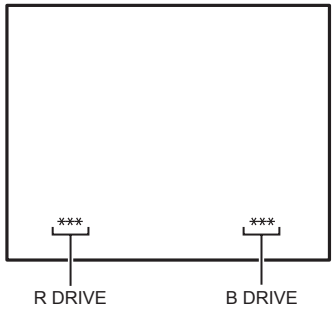


8. HIGH LIGHT

The settings for HIGH LIGHT is described in the WHITE BALANCE page of ADJUSTMENT PROCEDURE.

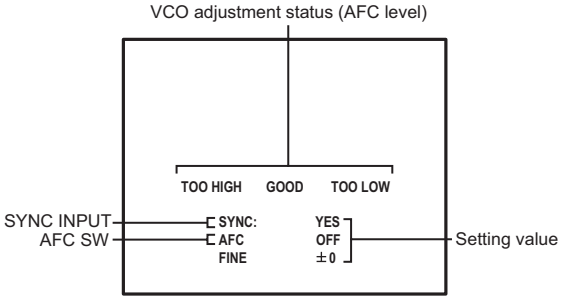
NOTE:

The setting value will be stored automatically when release the REMOTE CONTROL UNIT keys.



9. VCO

The setting for VCO is described in the IF VCO page of ADJUSTMENT PROCEDURE.



4.7 INITIAL SETTING VALUE OF SERVICE MODE

(1) Adjustment of the SERVICE MODE is made on the basis of the initial setting values ; however, the new setting values which set the screen in its optimum condition may differ from the initial setting.
(2) Do not change the initial setting values of the setting items NOT LISTED IN ADJUSTMENT PROCEDURE.
(3) --- : This mark described in each table shows "Cannot adjust it."

4.7.1 [1.V/C(S)]

No.	Setting item	Variable range	Initial setting value				
			RF			EXTERNAL (S / COMPOSITE)	EXTERNAL (COMPONENT)
			STANDARD		THEATER	STANDARD	STANDARD
			4:3	16:9	4:3	4:3	
S01	BRIGHT	0 ~ 127	64	---	---	---	---
S02	PICTURE	0 ~ 127	65	---	---	---	---
S03	COLOR	0 ~ 127	41	---	---	---	44
S04	TINT	0 ~ 127	67	---	---	---	62
S05	DETAIL	0 ~ 63	30	---	---	35	40
S06	BRIGHT+-	-32 ~ +32	---	±0	±0	-3	-2
S07	PICT+-	-32 ~ +32	---	±0	±0	-7	±0
S08	COLOR+-	-32 ~ +32	---	±0	-3	+1	---
S09	TINT+-	-32 ~ +32	---	±0	-6	-6	---
S10	DETAIL+-	-32 ~ +32	---	---	+3	---	---

No.	Setting item	Variable range	Initial setting value							
			RF / EXTERNAL (S / COMPOSITE)				EXTERNAL (COMPONENT)			
			STANDARD		THEATER		STANDARD		THEATER	
			LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
S11	R CUT OFF	0 ~ 255	30	---	---	---	---	---	---	---
S12	G CUT OFF	0 ~ 255	30	---	---	---	---	---	---	---
S13	B CUT OFF	0 ~ 255	30	---	---	---	---	---	---	---
S14	R DRIVE	0 ~ 127	64	---	---	---	---	---	---	---
S15	B DRIVE	0 ~ 127	64	---	---	---	---	---	---	---
S16	R CUT +-	-128 ~ +127	---	±0	±0	±0	±0	---	---	---
S17	G CUT +-	-128 ~ +127	---	±0	±0	±0	±0	---	---	---
S18	B CUT +-	-128 ~ +127	---	±0	±0	±0	±0	---	---	---
S19	R DRV +-	-128 ~ +127	---	+5	+13	+7	±0	---	---	---
S20	B DRV +-	-128 ~ +127	---	+6	-25	-9	±0	---	---	---
S21	NTSC MAT	0 ~ 3	3	3	1	1	2	2	1	1
S22	BLACK ST	0 ~ 3	1	---	1	---	---	---	---	---
S23	DCREST	0 ~ 1	1	---	1	---	---	---	---	---
S24	DCRSW	0 ~ 1	1	---	1	---	---	---	---	---

No.	Setting item	Variable range	Initial setting value		
			RF	EXTERNAL (S / COMPOSITE)	EXTERNAL (COMPONENT)
S25	ASY SHRP	0 ~ 7	4	4	4
S26	BPF FØ	0 ~ 1	0	0	---
S27	KILR OFF	0 ~ 1	0	0	---
S28	KILR SEN	0 ~ 1	1	1	---

No.	Setting item	Variable range	Initial setting value
S29	RGB MUTE	0 ~ 1	0
S30	BLUE B	0 ~ 1	1
S31	VIDEO SW	0 ~ 3	3
S32	CMP ABCL	0 ~ 1	0
S33	OSD ABL	0 ~ 1	0
S34	OSD CONT	0 ~ 63	6
S35	SUB CONT	0 ~ 15	8
S36	ABL GAIN	0 ~ 3	0
S37	ABL PNT	0 ~ 3	3
S38	Y GAMMA	0 ~ 3	1
S39	Y MUTE	0 ~ 1	0
S40	SVM GAIN	0 ~ 3	3
S41	SVM PH	0 ~ 3	0
S42	WPL	0 ~ 1	0
S43	COL GMM	0 ~ 1	0
S44	V1 GAIN	0 ~ 7	4
S45	VMOFF DE	-128 ~ +127	±0
S46	APC CLK	0 ~ 1	1
S47	PIP ADJ	0 ~ 15	0

4.7.2 [2. DEF (D)]

No.	Setting item	Variable range	Initial setting value		
			RF		EXTERNAL
			4:3	16:9	4:3
D01	V FREQ	0 ~ 3	0	0	3
D02	AFC GAIN	0 ~ 3	0	0	2
D03	H POSI	0 ~ 31	8	---	8
D04	H POSI+-	-128 ~ +127	---	0	---
D05	V PHASE	0 ~ 7	0	---	0
D06	V PH+-	-128 ~ +127	---	0	---
D07	V SIZE	0 ~ 127	55	---	55
D08	V SIZE+-	-128 ~ +127	---	-26	---
D09	V CENTER	0 ~ 63	32	---	32
D10	V CENT+-	-128 ~ +127	---	0	---
D11	V S CORR	0 ~ 15	4	---	4
D12	V S CO+-	-128 ~ +127	---	±0	---
D13	V LIN	0 ~ 15	11	---	11
D14	V LIN+-	-128 ~ +127	---	±0	---
D15	H SIZE	0 ~ 63	32	---	32
D16	H SIZE+-	-128 ~ +127	---	±0	---
D17	WVMT TOP	0 ~ 3	0	2	0
D18	WVMT BTM	0 ~ 3	0	2	0
D19	EWCR TOP	0 ~ 31	16	---	16
D20	EWCR T+-	-128 ~ +127	---	±0	---
D21	EWCR BTM	0 ~ 31	16	---	16
D22	EWCR B+-	-128 ~ +127	---	±0	---
D23	EW PARA	0 ~ 63	26	---	26
D24	EW PAR+-	-128 ~ +127	---	±0	---
D25	V EHT	0 ~ 7	0	---	0
D26	V EHT+-	-128 ~ +127	---	±0	---
D27	H EHT	0 ~ 7	0	---	0
D28	H EHT+-	-128 ~ +127	---	±0	---
D29	TRAPEZ	0 ~ 63	34	---	34
D30	TRAPEZ+-	-128 ~ +127	---	±0	---
D31	V AGC	0 ~ 1	0	0	0
D32	BLANK SW	0 ~ 1	0	0	0
D33	VRMP BI	0 ~ 1	0	0	0

4.7.3 [3. SOUND(A)]

No.	Setting item	Variable range	Initial setting value
A01	IN LEVEL	0 ~ 15	12
A02	LOW SEP	0 ~ 63	39
A03	HI SEP	0 ~ 63	16
A04	SAPC	0 ~ 1	0
A05	BBE BASS	-128 ~ +127	±0
A06	BBE TRE	-128 ~ +127	±0
A07	AHS MVE	-128 ~ +127	±0
A08	AHS MSC	-128 ~ +127	±0

4.7.4 [4. OTHERS(F)] [Do not adjust : All fixed]

No.	Setting item	Variable range	Initial setting value
F01	OSD POSI	0 ~ 255	24
F02	OSD FREQ	0 ~ 255	83
F03	CCD POSI	0 ~ 255	44
F04	CCD FREQ	0 ~ 255	93
F05	CCD CONT	0 ~ 63	11
F06	PUR WBCK	0 ~ 1	0
F07	PUR CONT	0 ~ 63	62
F08	CCD PCHK	0 ~ 1	1
F09	VMOFF	0 ~ 1	0
F10	VNR CHK	0 ~ 255	3
F11	VCSN TM	0 ~ 255	5
F12	VM DAT A	-128 ~ +127	+8
F13	VM DAT B	-128 ~ +127	-4
F14	VM DAT C	-128 ~ +127	-10
F15	VM DAT D	-128 ~ +127	-16
F16	VM DAT E	0 ~ 1	0
F17	XDSID TM	0 ~ 255	15
F18	FM TRAP	0 ~ 1	0

4.7.5 [5. 3L Y/C(LYC)] [Do not adjust : All fixed]

No.	Setting item	Variable range	Initial setting value
LYC01	MODE	0 ~ 7	4
LYC02	VENH	0 ~ 7	1
LYC03	PDSOFF	0 ~ 1	0
LYC04	CB	0 ~ 1	0
LYC05	VNLR	0 ~ 15	2
LYC06	GSEL0	0 ~ 1	0
LYC07	GSEL1	0 ~ 1	1
LYC08	COR	0 ~ 3	0
LYC09	TRAP	0 ~ 1	1
LYC10	CHTRAP	0 ~ 1	0
LYC11	CBPF	0 ~ 1	0
LYC12	ENHOFF	0 ~ 1	0

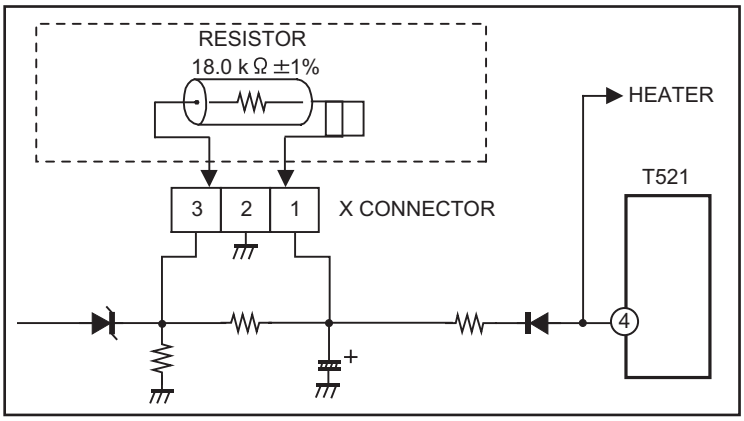
4.7.6 [12. SYSTEM(SYS)] [Do not adjust : All fixed]

No.	Setting item	Variable range	Initial setting value	
			AV-20F475	AV-N21F45
SYS01	VIDEO IN	0 ~ 3	3	3
SYS02	VSM	0 ~ 1	0	0
SYS03	CLR TEMP	0 ~ 1	1	1
SYS04	THEATER	0 ~ 1	1	1
SYS05	THEA PRO	0 ~ 1	1	1
SYS06	GAME MD	0 ~ 1	0	0
SYS07	AHS	0 ~ 1	0	0
SYS08	HYPER SR	0 ~ 1	1	1
SYS09	BBE	0 ~ 1	0	0
SYS10	S SOUND	0 ~ 1	1	1
SYS11	16:9 MD	0 ~ 1	1	1
SYS12	S CCD	0 ~ 1	1	1
SYS13	ID DISP	0 ~ 1	1	0
SYS14	CH LABEL	0 ~ 1	1	1
SYS15	V LABEL	0 ~ 1	1	1
SYS16	W CLOCK	0 ~ 1	1	1
SYS17	PIM	0 ~ 1	1	1
SYS18	PURITY	0 ~ 1	0	0
SYS19	VOL MUTE	0 ~ 1	0	0
SYS20	VCHIP	0 ~ 1	1	0
SYS21	VCHIP CA	0 ~ 1	1	0
SYS22	CCD	0 ~ 1	1	1
SYS23	HYPSCAN	0 ~ 1	1	1
SYS24	JVC LOGO	0 ~ 1	1	1
SYS25	PANORAMA	0 ~ 1	0	0

4.8 ADJUSTMENT PROCEDURE

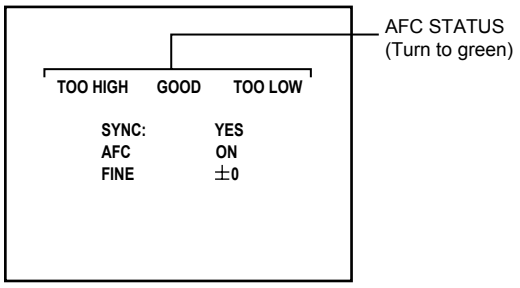
4.8.1 CHECK ITEM

Item	Measuring instrument	Test point	Adjustment part	Description
B1 VOLTAGE	Signal generator DC voltmeter	TP-91(R927) TP-E (IC421 Heatsink) [MAIN PWB]		(1) Receive the black and white signal. (color off) (2) Connect the DC voltmeter to the TP-E and TP-91. (3) Confirm that the voltage is DC134V±2V.
HIGH VOLTAGE HOLD DOWN	Resistor	X connector 1-pin 3-pin [MAIN PWB]		• After reparing the high voltage hold down circuit. This circuit shall be checked to operate correctly. (1) Turn the power switch to on. (2) Refer to the figure, connect the resistor between X connector 1-pin and 3-pin. (3) Make sure that the screen picture disappeares. (4) Disconnect the power plug. (5) Remove the resistor. (6) Again connect the power plug. (7) Turn the power switch to on. (8) Make sure that the normal picture is displayed on the screen.



4.8.2 TUNER / IF CIRCUIT

Item	Measuring instrument	Test point	Adjustment part	Description
IF VCO	Remote control unit		[9.VCO] CW transf. (T111) [MAIN PWB]	• It must not adjust without inputting the RF signal. (1) Receive any broadcast. (2) Select 9.VCO from the SERVICE MODE. (3) Change the "AFC" to "OFF" and "FINE" to "0". (4) Confirm that the color change from "TOO HIGH" to "TOO LOW" by CW transf. on MAIN PWB, and check the "SYNC" is "YES". (5) Adjust CW transf. until "GOOD" letters turns green. And then confirm that the "SYNC" is "YES" again. Adjustment can be done in this statement. (6) It return the "AFC" to "ON". (7) Push the [EXIT] key to exit the 9.VCO.



4.8.3 FOCUS

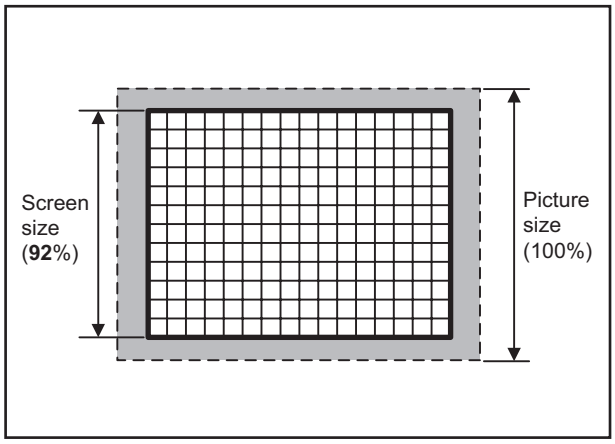
Item	Measuring instrument	Test point	Adjustment part	Description
FOCUS	Signal generator		FOCUS VR [In HVT]	(1) Receive the cross-hatch signal. (2) While watching at the screen, adjust the FOCUS VR to the vertical and horizontal lines will be thinnest and sharpest center horizontal line. (3) Make sure that the picture is in focus even when the screen gets darkened.

4.8.4 DEFLECTION CIRCUIT

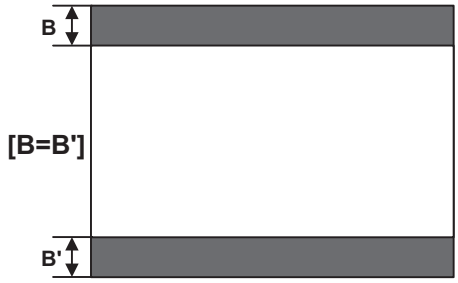
- The setting (adjustment) using the remote control unit is made on the basis of the initial setting values.
- The setting values which adjust the screen to the optimum condition can be different from the initial setting values.

<table>
<tr><th>Item</th><th>Measuring instrument</th><th>Test point</th><th>Adjustment part</th><th>Description</th></tr>
<tr><td>V. SIZE /
V. POSITION
(4:3)</td><td>Signal generator

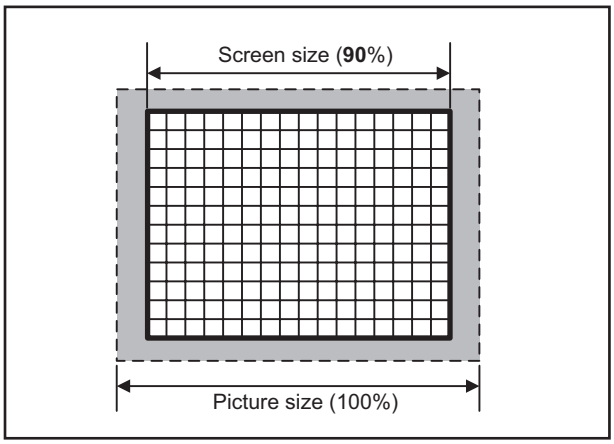
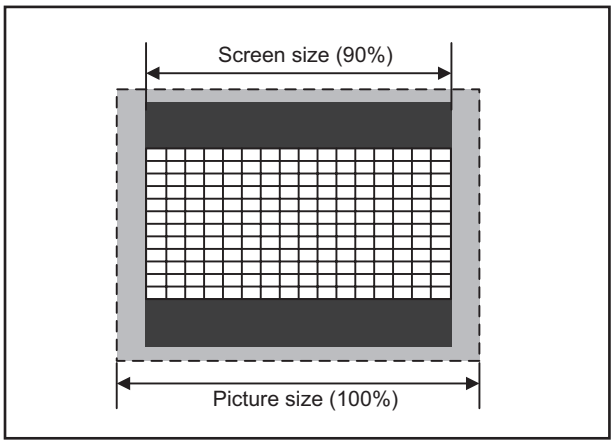
Remote control unit</td><td></td><td>[2.DEF (D)]
D05: V PHASE
D07: V SIZE
D13:V LIN
D11:VS CORR

V. CENTER SW
(S401)
[MAIN PWB]</td><td>(1) Receive the cross-hatch signal.
(2) Select 2.DEF(D) from the SERVICE MODE.
(3) Select the < D05 > (V PHASE).
(4) Check that the value of < D05 > is 0.
(5) Adjust the vertical screen size of the visible screen top to 92% with the < D07 > (V SIZE) and V CENTER SW.
NOTE :
• Bottom is to be located within 85%~95% range.
• When vertical linearity is not even, adjust vertical linearity by < D13 > (V LIN) and < D11 > (VS CORR).</td></tr>
<tr><td colspan="4"> 

<table>
<tr><th>Setting item</th><th>Initial setting value</th></tr>
<tr><td>D05: V PHASE</td><td>0</td></tr>
<tr><td>D07: V SIZE</td><td>55</td></tr>
</table></td></tr>
<tr><td>V. SIZE /
V. POSITION
(16:9)</td><td>Signal generator

Remote control unit</td><td></td><td>[2.DEF (D)]
D08: V. SIZE+-
D14: V. LIN+-</td><td>• V. SIZE / V. POSITION (4:3) adjustment should be finished.
(1) Receive the black and white signal (color off).
(2) Select 16:9 mode.
(3) Confirm that the width of V. BLANKING is equal to adjustment value (B).
(4) If the adjustment is not correct, select 2.DEF(D) from the SERVICE MODE.
(5) Then adjust the < D08 > (V. SIZE+-) and < D14 > (V. LIN+-) to be same to adjustment value (B).
NOTE :
• When you change the VERTICAL adjustment value of the regular mode (4:3), confirm the adjustment of 16:9 mode again.
<table><tr><th>Setting item</th><th>Initial setting value</th></tr><tr><td>D08: V SIZE+-</td><td>-26</td></tr><tr><td>D14: V LIN+-</td><td>0</td></tr></table></td></tr>
<tr><td colspan="4"> 

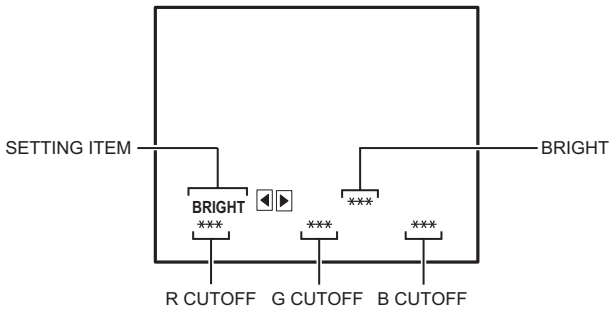
<table>
<tr><th>Adjust point</th><th>Setting value</th></tr>
<tr><td>B</td><td>67mm</td></tr>
</table></td></tr>
</table>

Item	Measuring instrument	Test point	Adjustment part	Description
H. SIZE / H. POSITION / SIDE PIN (4:3)	Signal generator Remote control unit		[2.DEF (D)] D03: H POSI D15: H SIZE D23: EW PARA D19: EWCR TOP D21: EWCR BTM	• V. SIZE / V. POSITION adjustment should be finished. (1) Receive a cross-hatch signal. (2) Select 2.DEF(D) from the SERVICE MODE. (3) Select the < D03 > (H POSI). (4) Adjust by H. POSITION to be same size at both side. (5) Adjust the horizontal size of the visible screen to 90% with the < D15 > (H. SIZE). (6) Adjust the vertical line at both side to become linear line by < D23 > (EW PARA). (7) Confirm the linearity of vertical line and horizontal size. (8) If it is necessary, readjust 1.~7. **NOTE :** • If it is not straight at the vertical upper and bottom corner line adjust the upper and bottom corner pin by < D19 > (EWCR TOP) and < D21 > (EWCR BTM).
				
H. POSITION / H. SIZE / SIDE PIN (16:9)	Signal generator Remote control unit		[2.DEF (D)] D16: H SIZE+- D04: H POSI+- D24: EW PAR+- D20: EWCR T+- D22: EWCR B+-	• V. SIZE / V. POSITION adjustment should be finished. • H. SIZE / H. POSITION / SIDE PIN adjustment should be finished. (Regular size(4:3)). (1) Receive the cross-hatch signal. (2) Select 16:9 mode. (3) Confirm both sides of cross-hatch to be the adjustment value 90%. (4) If it not correct, select 2.DEF(D) from the SERVICE MODE. (5) Adjust to be value 90% at the < D16 > (H SIZE+-) and < D04 > (H POSI+-). (6) Confirm the second vertical line from left to right to be straight. (7) If it is not straight, adjust to be straight by < D24 > (EW PAR+-), < D20 > (EWCR T+-) and < D22 > (EWCR B+-). **NOTE :** • Review the adjustment of 16:9 mode again when you change the SIDE PIN adjustment value of regular (4:3) mode.
				

4.8.5 VIDEO CIRCUIT

Item	Measuring instrument	Test point	Adjustment part	Description
WHITE BALANCE (LOW LIGHT)	Signal generator Remote control unit		[1.V/C (S)] S01: BRIGHT S11: R CUTOFF S12: G CUTOFF S13: B CUTOFF [7.LOW LIGHT] SCREEN VR [in HVT]	(1) Receive the black and white signal (color off). (2) Set the VIDEO STATUS to STANDARD. (3) Set the COLOR TEMPERATURE to LOW. (4) Select the 1.V/C (S) from the SERVICE MODE. (5) Set the initial setting value of < S11 > (R CUTOFF), < S12 > (G CUTOFF), < S13 > (B CUTOFF) and < S01 > (BRIGHT). (6) Return to the main menu in the SERVICE MODE. (7) Select the 7.LOW LIGHT from the SERVICE MODE. (8) Display a single horizontal line by pressing the [1] key. (9) Turn the SCREEN VR all the way to the left. (10) Turn the SCREEN VR gradually to the right from the left until either one of the red, blue or green colors appears faintly. (11) Adjust the two colors which did not appear until the single horizontal line that is displayed becomes white using the [4]~[9] keys. (12) Turn the SCREEN VR until the single horizontal line is displayed faintly. (13) Press the [2] key to cancel the single horizontal line mode. (14) Return to the main menu in the SERVICE MODE. (15) Select the 1.V/C (S) from the SERVICE MODE. (16) Adjust the BRIGHT level to become the black component shines white slightly by < S01 >. (17) Confirm that whether the color ingredient of R, G, or B is visible to the black component, which shines white slightly. (18) When the color ingredient can be seen, two colors other than a visible color are adjusted, and it is made to look white. (19) Return the value of < S01 > to initial setting value. • The [3] (EXIT) key is the cancel key for the WHITE BALANCE.

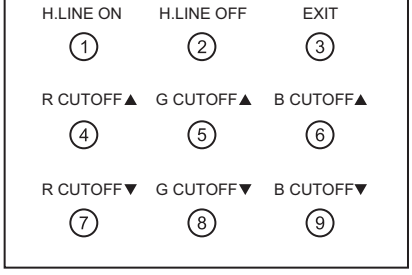
LOW LIGHT adjustment mode



SINGLE HORIZONTAL LINE

Setting item	Initial setting value
S11: R CUT OFF	30
S12: G CUT OFF	30
S13: B CUT OFF	30
S01: BRIGHT	64

REMOTE CONTROL UNIT

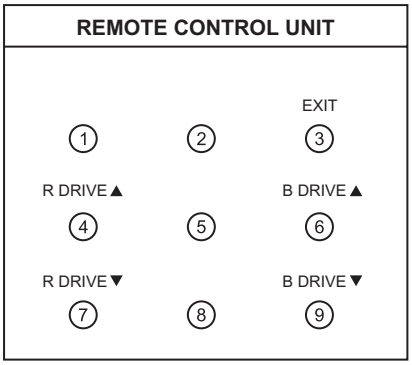
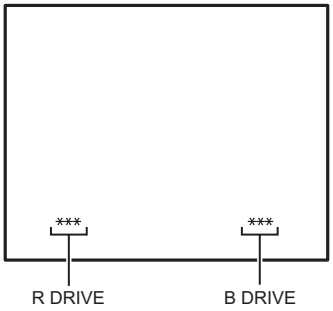


<table>
<tr><th>Item</th><th>Measuring instrument</th><th>Test point</th><th>Adjustment part</th><th>Description</th></tr>
<tr><td>WHITE BALANCE (HIGH LIGHT)</td><td>Signal generator

Remote control unit</td><td></td><td>[1.V/C (S)]
S14: R DRIVE
S15: B DRIVE

[8.HIGH LIHGT]</td><td rowspan="2">(1) Receive the black-and-white signal (color off).
(2) Set the VIDEO STATUS to STANDARD.
(3) Set the COLOR TEMPERATURE to LOW.
(4) Select the 1.V/C (S) from the SERVICE MODE.
(5) Set the initial setting value of < S14 > (R DRIVE) and < S15 > (B DRIVE).
(6) Return to the main menu in the SERVICE MODE.
(7) Select the 8.HIGH LIGHT from the SERVICE MODE.
(8) Adjust the screen until it becomes white using the [4] , [6], [7] and [9] keys.

• The [3] (EXIT) key is the cancel key for the WHITE BALANCE.

  </td></tr>
<tr><td colspan="4">HIGH LIGHT adjustment mode
 
<table><tr><th>Setting item</th><th>Initial setting value</th></tr><tr><td>S14: R DRIVE</td><td>64</td></tr><tr><td>S15: B DRIVE</td><td>64</td></tr></table></td></tr>
<tr><td>SUB BRIGHT</td><td>Remote control unit</td><td></td><td>[1.V/C (S)]
S01: BRIGHT</td><td rowspan="2">(1) Receive any broadcast.
(2) Set the VIDEO STATUS to STANDARD.
(3) Select the 1.V/C (S) from the SERVICE MODE.
(4) Select < S01 > (BRIGHT).
(5) Set the initial setting value of the < S01 >.
(6) If the brightness is not the best with the initial setting value, make fine adjustment of the < S01 > until you get the optimum brightness.</td></tr>
<tr><td colspan="4"><table><tr><th>Setting item</th><th>Initial setting value</th></tr><tr><td>S01: BRIGHT</td><td>64</td></tr></table></td></tr>
<tr><td>SUB CONTRAST</td><td>Remote control unit</td><td></td><td>[1.V/C (S)]
S02: PICTURE</td><td rowspan="2">(1) Receive any broadcast.
(2) Set the VIDEO STATUS to STANDARD.
(3) Select the 1.V/C (S) from the SERVICE MODE.
(4) Select < S02 > (PICTURE).
(5) Set the initial setting value of the < S02 >.
(6) If the contrast is not the best with the initial setting value, make fine adjustment of the < S02 > until you get the optimum contrast.</td></tr>
<tr><td colspan="4"><table><tr><th>Setting item</th><th>Initial setting value</th></tr><tr><td>S02: PICTURE</td><td>65</td></tr></table></td></tr>
</table>

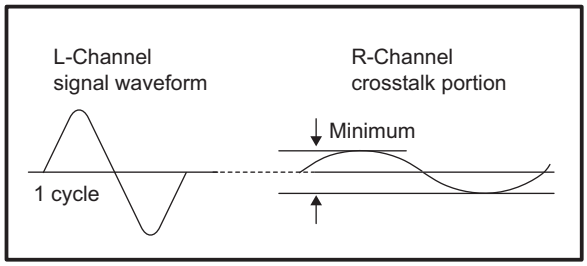
4.8.6 MTS CIRCUIT

<table>
<tr><th>Item</th><th>Measuring instrument</th><th>Test point</th><th>Adjustment part</th><th>Description</th></tr>
<tr><td>MTS INPUT LEVEL</td><td>Remote control unit</td><td></td><td>[3.SOUND (A)]
A01: IN LEVEL</td><td>(1) Receive any broadcast.
(2) Select the 3.SOUND (A) from the SERVICE MODE.
(3) Select the < A01 > (IN LEVEL).
(4) Set the initial setting value of the < A01 >.

<table><tr><th>Setting item</th><th>Initial setting value</th></tr><tr><td>A01: IN LEVEL</td><td>12</td></tr></table></td></tr>
<tr><td>MTS SEPARATION</td><td>TV audio multiplex signal generator

Oscilloscope

Remote control unit</td><td>R OUT
L OUT
[AUDIO OUT]</td><td>[3.SOUND (A)]
A02: LOW SEP.
A03: HI SEP.</td><td rowspan="2">(1) Input the stereo L signal (300Hz) from the TV audio multiplex signal generator to the antenna terminal.
(2) Connect an oscilloscope to R OUT pin of the AUDIO OUT, and display one cycle portion of the 300Hz signal.
(3) Select the 3.SOUND (A) from the SERVICE MODE.
(4) Select the < A02 > (LOW SEP.).
(5) Set the initial setting value of the < A02 >.
(6) Adjust the < A02 > so that the stroke element of the 300Hz signal will become minimum.
(7) Change the connection of the oscilloscope to L OUT pin of the AUDIO OUT, and enlarge the voltage axis.
(8) Change the signal to 3kHz, and similarly adjust the < A03 > (HI SEP.).

<table><tr><th>Setting item</th><th>Initial setting value</th></tr><tr><td>A02: LOW SEP</td><td>39</td></tr><tr><td>A03: HI SEP</td><td>16</td></tr></table></td></tr>
<tr><td colspan="4"> 
</td></tr>
</table>

SECTION 5
TROUBLESHOOTING

This service manual does not describe TROUBLESHOOTING.

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Printed in Japan
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